MONTGOMERY WATSON

May 2, 1997

Michael Bellot, Project Manager
United States Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Re: Response to Comments
Expedited Final Design of Leachate Collection System
Blackwell Forest Preserve Landfill

Dear Mr. Bellot:

We have reviewed the U.S. Environmental Protection Agency's (U.S. EPA's) and Illinois Environmental Protection Agency's (IEPA's) comments on the February 1997 Expedited Leachate Collection System (LCS) Design Report for the Blackwell Forest Preserve Landfill in DuPage County, Illinois. The Agency's comments are outlined in the U.S. EPA's April 4, 1997 letter to the Forest Preserve District of DuPage County (FPD). Based on our review of the Agency's comments and discussions during our April 23, 1997 meeting, we are pleased to submit the enclosed responses to Agency comments.

For clarity, the Agency's April 4, 1997 comments are presented below, followed by our response in bold text. Subsequent modifications to the text of the LCS Design Report are summarized in the attached redline/strikeout version of the report text. As well, all noted changes are incorporated into the attached revised LCS Design Report.

A. AGENCY COMMENTS:

General

Comment
The design should include calculations supporting the selection of pumps for the leachate extraction wells and the lift station, drawings and details for the compressor station, including the foundation slab, and calculations for sizing the compressor. This information can be placed in an appendix.

Response
Montgomery Watson proposes to utilize a single supplier for the leachate well pumps and lift station systems, including the compressor system and control building. Once

Tel 630 691 5000
Fax 630 691 5133

the supplier is under contract, the supplier will provide us with drawings and details for the equipment including sizing calculations for the pumps, compressor, and building foundation. As soon as this information is available, it will be provided to the Agencies as an addendum to the appendices of the Expedited Final Design.

Comment
The construction specifications (see Section 01500 in Appendix B), state that the work to be performed includes installation of silt fences (see Section 01010 in Appendix B) to control soil erosion during construction. The locations of the silt fences are not shown on the drawing sheets, and the cost of the silt fences does not appear to be included in the capital cost estimate in Appendix C.

Response
The silt fencing will be placed, on an as-needed basis, as directed by the CQA Engineer. The silt fences will remain in place as long as necessary until work is completed and vegetation has been re-established. A specification for silt fences has been added to the Design Report, and cost allowance has been included in the cost estimate.

Specific

Section 2, Leachate Control, General, Page 5, Paragraph 3, Last Sentence:
Comment
The text states that the criteria for implementing an active gas extraction system will be outlined in the operation and maintenance (O&M) plan. Based on the design document, it appears that the system will be designed for active landfill gas extraction but will begin with passive extraction.

However, there is no discussion of the criteria that will be used to determine if the system is to be transitioned from passive to active. Although past studies have indicated that gas may not be a significant problem, typically, an active system is designed, installed, optimized and run for a period of time. During this operation, real data is compared to pre-determined criteria to determine if and when the system can be down-graded from active to passive. The criteria for implementing the active gas extraction system is an important component of the remedial design and should be clearly specified (i.e., the type and frequency of active and passive monitoring, the required criteria/thresholds for starting and stopping active/passive gas extraction, the criteria to optimize and measure the effectiveness of the system, operational considerations like whether the system will be pulsed versus continuous operation etc.).

Response
The text of the Design Report has been revised to clarify the landfill gas (LFG) collection system. The LFG collection system will be initiated in a phased approach. The first phase consists of passively venting the nine leachate extraction wells through

the LFG header pipe to a single vent pipe stack located on the top of the landfill. (The location of the gas vent has been modified from that discussed with the Agencies during the April 23, 1997 meeting.) The quality and quantity of the venting LFG will be monitored over a short period of time, and based upon the monitoring results, the need for a passive vent flare will be evaluated. If gas flaring is technically possible and determined to be necessary, a flare will be installed.

The LFG system is designed to be upgraded in the future, if necessary, to an active gas system. An active gas system will be required if it is determined in the future that uncontrolled gas emissions are occurring through or around the landfill cap. The future O&M plan will include the specific criteria for deciding whether to upgrade the system from passive to active. Should it be decided to upgrade the passive system to an active system, we will provide the Agencies with a complete design and construction plan for their approval.

Section 2, Conveyance Pipe System, Page 8, Paragraph 3:

Comment
This paragraph states that the existing pipe connecting MH3 to MH2 will be disconnected and abandoned in place. Please clarify that this is indeed the leachate pipe that passes under the north part of the landfill and discharges into the woods. If not, please discuss the plans for their leachate pipe in detail.

Response
This pipe is indeed the stormwater pipe that passes under the north part of the landfill and can discharge into the woods. The text of the Design Report has been revised to describe the two options for collecting drainage from this pipe which were provided to the Agencies at the April 23, 1997 meeting. The LCS system will be designed to allow liquids from Manhole MH3 to discharge either into the leachate gravity conveyance pipe, or to existing Manhole MH2. The liquids in Manhole MH3 are currently under evaluation (i.e., the liquids were sampled on April 24, 1997 and are currently being analyzed in accordance with the approved QAPP for the Predesign Work Plan). These liquids will continue to be evaluated during LCS installation and cover repairs. If the liquids are determined to be impacted by landfill leachate, the liquids will be directed into the LCS. If the liquids are determined not to be impacted, they can be directed to MH2, which in turn will direct water to a discharge point located further to the north.

Section 2, Conveyance Pipe System, Page 9, Bullet 5 and Drawing Sheet D2:

Comment
The text states that control wires may be included in the pipe trench and the pipe trench details in Detail 5 on Drawing sheet D2 show lift station and well pump control wires in the trench. The purpose of the control wires in the trench is not clear (the pumps being used

are identified as pneumatic pumps that do not require electrical control wires). Although this is a very minor comment, it may be more accurate to revise the term "control wires" to indicate that the pipe trench will actually carry wires for transmitting leachate flow information for individual wells to the compressor station control building and not to imply that they control down well pumps.

Response

The pipe trench will include control wires for carrying cycle count information from each of the nine extraction wells and the lift station pump. The wires will be equivalent to telephone lines carrying a 4-20 mA signal. There will not be any electrical power transmitted through the pipe trenches.

Section 2, Final Cover Restoration, Page 10, Paragraph 1, Lines 2 through 4:

Comment

This section indicates that the excavated refuse will be segregated and tested for hazardous waste characteristics using toxicity characteristics leaching procedure (TCLP) protocols if screening of the refuse with a photoionization detector (PID) produces a reading greater than 100 parts per million. The rationale for choosing only the VOCs detectable using 11.7 eV PID for this waste determination procedure does not appear complete and should be revisited (i.e., the refuse may have inorganic contaminants that may exceed TCLP threshold values).

Response

As discussed during the April 23, 1997 meeting, we will endeavor to not excavate and remove any waste materials that require off-site disposal. Based upon the results of the Predesign Investigation, it appears that waste will not be encountered in the excavations for the conveyance pipes. However, under the current design, buried wood or construction debris may be encountered in the excavation for lift station LS01 and drip leg DL01. Alternatively, because the clay berms for the landfill cells are also located in this area, we may encounter only clay. Therefore, prior to construction in this area, we undertake a field investigation to assess the subsurface conditions in the immediate area and to determine the best location for LS01 and DL01. The results of the investigation will be provided to the Agencies. However, if waste must be excavated for any reason, it will be containerized and tested for TCLP prior to disposal.

Comment

Section 2, Driplegs, Page 10, Paragraph 2:

The second sentence discusses how the inlet and outlet pipes will control the liquid level in the trap. The design may want to consider placing the gas header inlet pipe at a higher invert elevation than the condensate inlet pipe. In the unlikely event that liquids accumulate due to flow restriction, an additional safety factor may protect liquids from back flowing into the gas system.

Response
The comment is noted and the dripleg pipes have been modified to take advantage of the U.S. EPA suggestion.

Comment
It appears that the major difference between the active and passive system is the addition/operation of blower and the pressure affect this blower places upon the gas collection system. Is it accurate to state that the driplegs would actually be "negative pressure" only when the blower is operating (placing a vacuum on the dripleg, leachate in the trap, the header pipe system, extending to the wellhead and own well)? If so, what are the operating vacuum pressures, how were they derived and where and how often will they be measured in the system?

Design specifications for the discharge outflow for the active system at the blower should be presented (height of vent with regard to breathing zone, flaring apparatus construction and safety equipment, etc.).

Response
The dripleg would function as a "negative pressure dripleg" only under the circumstances that active LFG extraction was utilized. The dripleg has been conservatively sized, with an additional factor of safety, to account for conditions that would likely be expected if active extraction was necessary. Calculations are provided in the attached revised Final Design Report. The LFG vent design will be included with the drawings and specifications.

Comment
Section 2, Lift Station, Page 11, Paragraph 1:
The lift station will include installation "of" a surface vault...

Response
The text has been corrected.

Comment
Paragraph 3:
An interstitial conductivity probe is proposed for monitoring moisture in the space between the double walls of the leachate holding tank and it is further stated that the LCS will be shut down if moisture is detected. Please clarify whether a specific moisture level or any moisture in the space between the double walls will cause shutdown of the LCS. Also, verify that the tank and connecting pipe apparatus meet all Resource Conservation and Recovery Act (RCRA) Underground Storage Tank (UST) requirements.

Response
The probe sensitivity will be set to detect actual leaks, and not humidity, that may be present between the walls and at the bottom of the interstice. If a leak is detected, the LCS will be shut down. The system will not be restarted until the cause of any interstitial alarm condition is evaluated and corrected. As well, the tank and components are designed to meet all applicable RCRA requirements.

Comment
Section 3, Draft Operations & Maintenance Plan, Page 18, Paragraph 2:
The text lists items to be included in the O&M plan. This plan should also include a description of active gas extraction system activities.

Response
The draft O&M Plan will include a discussion of the phased approach to LFG control as described above.

Comment
Section 4, Project Schedule and Personnel, Page 20, Paragraph 2:
As you know, EPA seeks external comments from contractors and IEPA in addition to our internal review. We have previously negotiated specific turnaround times for these reviews, so our ability to change the required review time is limited. EPA will make every attempt to accommodate the request for accelerated review on the cap design deliverables. However, for planning purposes, we should assume a 45-day review time frame.

Response
We appreciate the U.S. EPA's willingness to make every attempt to expedite review times so that remedial construction can proceed as quickly as possible. We also appreciate the Agency's agreement to proceed with the expedited design of the cap repair, and we have modified the text of Section 4 and the schedule in Figure 1 to match the expedited schedule presented during our April 23, 1997 meeting (with slight modifications).

Comment
Page 21, Project Personnel, Paragraph 1 and Figure 3:
The EPA Project Manager can be identified as Michael Bellot, phone number (312) 353-6425, fax number (312) 353-5541.

Response
The new U.S. EPA Project Manager, Mr. Michael Bellot, is noted.

Comment
Figure 1:
The schedule should identify the O&M plan as a deliverable (see Section 3, Page 18) and the schedule should be revised to indicate a 45-day EPA review time (with the understanding that EPA will endeavor to expedite the cap design review).

Response

As noted above, we have modified the text of Section 4 and the schedule in Figure 1 to match the expedited schedule presented during our April 23, 1997 meeting.

Comment

Drawing Sheet D2, Detail 1:

This detail includes a table showing the schedule for well construction. The borehole depths and/or the well pipe lengths presented in this table appear incorrect. For example, for well EW01, the existing surface and base grade elevations are listed at 753.45 and 709.45 feet, respectively, which indicates a borehole depth of 44 feet (753.45 - 709.45 = 44). However, the table lists the borehole depth as 46.0 feet. Please check throughout the table.

Response

The Well Table is an indication of "record" conditions. The base grade elevation represents the elevation of the bottom of the refuse encountered. The borings were installed slightly beyond the base of waste to verify that bottom of waste had been truly reached. The boring was then backfilled with a minimum of one foot of bentonite. The previous drawing is incorrect in that it does not indicate the relation of borehole depth to the base grade. We have corrected this on the attached submittal.

Comment

Drawing Sheet D3, Detail 1:

The size, material, and function of the manual tank-truck loadout pipe should be added to the drawing sheet. In addition, Detail 1 shows a pneumatic pump used to pump leachate from the lift station. However, the design does not include a bubbler line or other device to control the operation of the leachate pump. The design of the lift station should be revised to include a means of controlling pump operations based on the level of the leachate in the lift station.

Response

The size, material, and function of the tank truck load out pipe will be included on the appropriate drawing. Additional information will also be included in the draft O&M Plan. The lift station pump has an internal float that will only pump if enough liquid is present to do so.

Drawing Sheet D3, Details 3 and 4:

Comment

Details 3 and 4 show that the gas header pipe is connected to the dripleg riser pipe by a horizontal pipe. Replacing the horizontal pipe with a pipe sloping downward from the gas header pipe to the riser dripleg pipe will result in more efficient removal of condensate from the gas header pipe. This change should be considered for the FPD design.

Response

The U.S. EPA comment is noted and the dripleg piping has been modified to account for the U.S. EPA suggestion.

Comment

Detail 4 shows that the gas header pipe from the well field is connected to the dripleg cleanout riser pipe in a manner that allows the condensate from the gas header pipe to flow to the dripleg. The piping arrangement shown in Detail 4 will remove the large condensate droplets collected in the pipe but will not remove the lighter condensate drops suspended in the gas in the pipe. Condensate collected in the pipe and some of the condensate drops suspended in the gas in the pipe may both be removed if the drip legs design is modified so that the gas header pipe from the well field is connected to the future blower pipe (i.e., an additional light condensate "drop out"). This connection can be made using an elbow such that the invert elevation of the blower pipe is higher than the crown elevation of the gas header pipe. This modification to the dripleg design should be considered to maximize the removal of condensate from the gas.

Response

If active LFG extraction is required in the future, additional condensate removal techniques will be evaluated with the overall blower design. Refer to the discussion of the phased approach to LFG control presented above. However, the U.S. EPA's suggested modifications to the potential blower inlet pipe have been incorporated into the design.

Comment

Drawing Sheet D4, Details 1 and 3:

Details 1 and 3 show the plan view and side profile view of the leachate holding tank, respectively. Both details show a 2-inch, Schedule 80, polyvinyl chloride, interstitial monitoring riser with a leak detection probe and controls. An addition detail of the monitoring riser and probe between the double walls of the tank should be provided to show where the probe and controls will be located.

Response

The probe is proposed as a conductivity-type probe that is attached to a wire and lowered down a riser pipe. The riser pipe attaches directly to a flange that accesses the space between the two walls of the double-walled tank. The riser pipe and wire penetration will be made with an air tight cap. The wire will be run underground in a conduit to the control panel and alarm system connections. This information has been added to the specifications. However, a drawing detail is not generally required, and, therefore, has not been added.

Comment

In addition, Note 1 in Detail 1 indicates that the condensate collected by the air compressor dewatering system will be piped directly to the leachate holding tank. However, none of the drawings shows the details needed for connecting the condensate pipe to the leachate holding

tank. All details needed for connecting the air compressor dewatering system to the leachate holding tank should be shown in the drawings.

Response
The condensate collected at the compressor dewatering system will be automatically piped to the holding tank. The specifications will require condensate handling, and the specific details and equipment will be provided by the system supplier. As soon as this information is available, it will be provided to the U.S. EPA as an addendum to the Appendices of the Expedited Final Design.

Comment
Drawing Sheet D4, Detail 2:
This detail shows an end-profile view of the leachate holding tank. The details should specify the material and capacity of the hold down strap.

Response
This information has been added to the specifications.

Comment
Drawing Sheet D4, Details 3 and 5;
These details show a 6-inch, high-density polyethylene leak detection riser. However, the function of this riser and whether it affects LCS operation are not explained anywhere in the design. This and other information regarding corrective action in the event that leachate is detected in the riser should be provided. In addition, installing a leak detection cable inside the riser and connecting the cable to the control system for shutting down the LCS in the event of a leak should be considered for the design.

Response
The leak detection riser of the dripleg discharge to the holding tank will be fitted with an electronic leak detection riser similar to that of the interstitial tank system. The electronic leak detection will shut down the system if a leak is detected, and the system will not be restarted until the cause of any leak detection riser alarm condition has been evaluated and corrected.

Comment
Section 01010, Page 01010-1, Item 1.02.A.2:
The phrase "and with associated cleanouts" appears to be missing necessary wording. This phrase should be checked and corrected.

Response
The comment is noted and the phrase will be reworked.

Comment
Section 01010, Page 01010-3, Item 1.03.C:
No LCS surveying cost is included in the capital cost estimate in Appendix C.

Response
The costs for surveying will be added to the cost estimate table of the LCS Expedited Final Design.

Comment
Section 15122, Page 15122-4, Item 2.01.A.1.a:
This item requires sizing the compressor to handle 14 extraction well pumps, including the lift station pump. As discussed in General Comment 1, calculations for sizing the compressor should be provided in an appendix to the design.

Response
As described above, this information will be provided by the equipment supplier. As soon as this information is available, it will be provided to the U.S. EPA as an addendum to the Appendices of the Expedited Final Design.

Comment
Section 15162, Page 15162-3, Item 301.A:
This item states that leachate well pumps will be installed in accordance with manufacturer instructions. A brief, general description of how and where the pumps will be installed should be provided because this information is not provided in the drawings.

Response
A pump will be installed at the base of each of the nine extraction wells. Additional information has been added to the specifications and to the drawings.

Comment
Section 15177, Page 15177-3, Item 3.02.C:
This item states that the leachate holding tank level indicators and interstitial monitoring probe will be installed in accordance with Section 15484, Compressed Air System. However, Section 15481 is missing from the specifications. This section should be provided for review.

Response
The specification reference is incorrect, and has been corrected.

Appendix C, Capital Cost Estimate

Comment
Table:
The cost estimate in this table should be revised to include the costs of erosion control (silt fences) and LCS surveying. The cost estimate should also include costs for engineering construction management, quality assurance (QA) and quality control (QC) testing, waste characterization testing, contingency, level, and permitting needs. In addition, costs for leachate extraction well installation should be included.

Response
The cost estimate will be revised to include these items.

Appendix F, Construction Quality Assurance Plan

Comment
Sections 3 and 4, Pages 3-1 through 3-5 and 4-1 through 4-5:
Sections 3 and 4 discuss project personnel responsibilities and construction QA activities, respectively. These sections indicate that field QC testing for in-place density and QA activities will both be conducted by the same party, Montgomery Watson. QC and QA activities should be performed independently from each other to verify the quality of the constructed project. Sections 3 and 4 should be revised to address this issue.

Response
Montgomery Watson will perform project quality assurance (QA), and quality control (QC) will be performed by an independent third party.

Comment
Section 5.5.7 Page 4-5 Paragraph 2:
The text states that the leachate holding tanks will be pressure-tested at the factory and again on site before its installation. It would be appropriate to also test the tank for leaks after its installation and connection to the leachate conveyance pipe from FPD DL02.

Response
The text has been modified to indicate that the tank and associated piping will be pressure tested after installation.

Appendix G, Quality Assurance Project Plan - Addendum No. 1

Comment
Table G-3
This table summarizes data-generating activities and associated quality objectives The analytical parameters for waste characterization are typically disposal facility-specific. Therefore, a footnote should be added to the table indicating that additional testing may be needed depending on the facility selected for waste disposal. Alternatively, if the disposal

facility is already known, a footnote should be added indicating that the analytical parameters specified are required by that facility.

Response
Comment is noted, and additional information has been added.

Comment
Appendix B, Section 02505:
Throughout this section, the word "course" should be corrected to "coarse."

Response
The word "course" is used correctly to describe a soil layer during construction. It does not refer to the description of the actual gravel materials.

Comment
Appendix B, Section 023733, Page 02733-2, Item 2.01.B.2:
The word "list" should be corrected to "lift."

Response
The comment is noted and the word change has been made.

Comment
Appendix B, Section 15162, Page 15162-2, Item 2.01.A.1:
On the third line, the word "approval" should be replaced with "approved."

Response
The comment is noted and the word change has been made.

Comment
Appendix D, Page 1, Assumption 4:
The term "saturated soil" should be replaced with "dry soil."

Response
The comment is noted and the word change has been made.

Comment
Appendix D, Page 2, Conclusion 4:
The term "Factor is safety" should be corrected to "Factor of Safety."

Response
The comment is noted and the word change has been made.

Comment
Appendix F, Section 3.4.2, Page 3-5 Bullet 3:
The word "of" should be inserted between "demonstration" and "bonding."

Response
The comment is noted and the word change has been made.

Comment
Appendix F, Section 4.4.8, Page 4-5, Paragraph 3:
On the fourth line, the word "manufactures" should be corrected to "manufacturers'"

Response
The comment is noted and the word change has been made.

B. ADDITIONAL DESIGN CHANGES:

During our modification of the LCS design, we also noted an inconsistency in the design. The previous design provided secondary containment beneath dripleg DL02 since it was located outside the edge of waste. However, we neglected to note that the conveyance pipes in the trench from the edge of waste to DL02 would be also have secondary containment. Therefore, we have modified the design drawings to note that, in this area, the pipes are to be surrounded by clay material, or an alternative low permeability material such as bentonite.

If you have any questions or comments about this letter or the attached revised Final LCS Design Report, please contact us at (630) 691-5000.

Sincerely,

MONTGOMERY WATSON

Peter J. Vagt, Ph.D.
Project Coordinator

Walter G. Buettner, P.E.
Supervising Engineer

Enclosures: Redline/strikeout version of report text
May 1997 Revised LCS Expedited Final Design Report (5)

cc: Mr. Joseph Benedict, Forest Preserve District (2 copies)
Mr. Rick Lanham, IEPA (3 copies)
Mr. Kostas Dovantis, PRC (2 copies)
Mr. Kurt Lindland, U.S. EPA Assistant Regional Counsel (1 copy)

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